

```

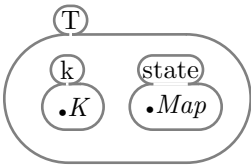
MODULE IMP-SYNTAX
  IMPORTS PL-ID+PL-INT
  AExp ::= Id | Int
         | AExp + AExp [strict]
         | AExp / AExp [strict]
  BExp ::= Bool
         | AExp ≤ AExp [seqstrict]
         | not BExp [strict]
         | BExp and BExp [strict(1)]
  List{Id} ::= Id
             | (.) . List{Id}
             | List{Id} , List{Id} [id: (.) . List{Id} assoc]
  Stmt ::= skip
         | Id := AExp [strict(2)]
         | Stmt ; Stmt
         | if BExp then Stmt else Stmt [strict(1)]
         | while BExp do Stmt
  Pgm ::= var List{Id} ; Stmt
END MODULE

```

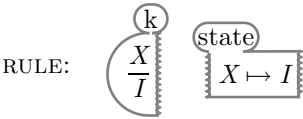
```

MODULE IMP-SEMANTICS
  IMPORTS K+IMP-SYNTAX
  KResult ::= Int | Bool
  K ::= AExp | BExp | Stmt | Pgm | List{Id}
  INITIAL CONFIGURATION:

```



K RULES:



RULE: $I_1 + I_2 \Rightarrow I_1 +_{Int} I_2$

RULE: $I_1 / I_2 \Rightarrow I_1 /_{Int} I_2$ when $I_2 \neq_{Bool} 0$

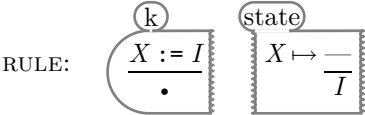
RULE: $I_1 \leq I_2 \Rightarrow I_1 \leq_{Int} I_2$

RULE: $\text{not } T \Rightarrow \text{not}_{Bool} T$

RULE: $\text{true and } B \Rightarrow B$

RULE: $\text{false and } \text{---} \Rightarrow \text{false}$

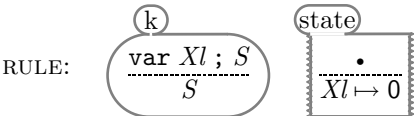
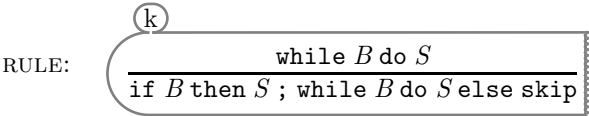
RULE: $\text{skip} \Rightarrow \bullet$



RULE: $S_1 ; S_2 \Rightarrow S_1 \curvearrowright S_2$

RULE: $\text{if true then } S \text{ else } \text{---} \Rightarrow S$

RULE: $\text{if false then } \text{---} \text{ else } S \Rightarrow S$

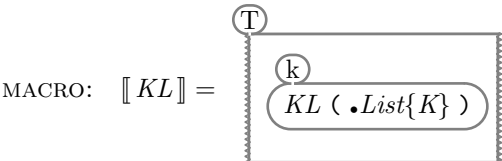


END MODULE

```

MODULE IMP
  IMPORTS IMP-SEMANTICS+IMP-PROGRAMS
  Bag ::= [ KLabel ]
        | pgm

```



MACRO: $\text{pgm} = [\text{sumPgm}]$

END MODULE